CLAIMS

1. Method of controlling data packet traffic at input of a network, the traffic comprising N streams and/or sub-streams which are each associated with a priority level, $N \geq 2$, each of the packets being marked with the priority level associated with the stream or sub-stream to which said packet belongs,

characterized in that it comprises a step for implementing a token bucket mechanism with N operating levels with N token buffers, each containing a number of available tokens, the tokens of each of the N token buffers being used to process one of the N priority levels, each of the packets being accepted or rejected depending on whether or not it is possible for tokens to be assigned to it depending on the tokens available at least in the token buffer used to process the priority level of said packet.

2. Method according to claim 1, characterized in that the traffic comprises N sub-streams each corresponding to one of the N hierarchical levels of a hierarchical stream or an aggregate of hierarchical streams.

3. Method according to claim 1, characterized in that the traffic comprises N sub-streams each corresponding to one of the N types of images of a multimedia stream or of an aggregate of multimedia streams.

4. Method according to claim 1, characterized in that the traffic comprises N streams each corresponding to one of the streams of a multiplex of at least two streams.

5. Method according to any of the claims 1 to 4, characterized in that the traffic comprises N streams and/or sub-streams belong to a same class of service.

6. Method according to any of the claims 1 to 5, characterized in that the rejected packets are discarded.

7. Method according to any of the claims 1 to 6, characterized in that the network is of an IP or equivalent type.

8. Method according to any of the claims 1 to 7, characterized in that each of the N levels of operation of a token bucket mechanism is managed by a regulator $b_i(r_i, bm_i)$, $i \in \{1 \text{ to } N\}$, with:

- r_i as the nominal bit rate of the regulator;

- bm_i the maximum size of the token buffer of the regulator;
- $b_i(t)$ the instantaneous value of the filling of the token buffer of the regulator.

9. Method according to any of the claims 1 to 8, characterized in that the tokens of the N token buffers are shared between the N priority levels, and a packet with priority level i can be assigned tokens from a token buffer associated with a priority level j having lower priority when the tokens available in the token buffer of the priority level i are not sufficient.

10. Method according to claim 9 characterized in that, for each priority level apart from the priority level having the highest priority, a quantity of tokens reserved exclusively for the packets having said priority level is guaranteed.

11. Method according to any one of the claims 9 and 10, characterized in that the assigning of tokens to a packet of priority level i is done in a discontinuous packet mode and the method consists in assigning:

- either tokens available in the token buffer of priority level i ;
- or tokens available in a token buffer of a lower priority level j, when the tokens available in the token buffer of priority level i are not sufficient.

12. Method according to any one of the claims 9 and 10, characterized in that the assigning of tokens to a packet of priority level i is done in a continuous bit mode and the method consists in assigning:

- tokens available in the token buffer of priority level i ;
- and, as a complement, tokens available in at least one token buffer of priority level j having lower priority, when the tokens available in the token buffer of priority level i are not sufficient.

13. Method according to any of the claims 1 to 12, characterized in that the packets accepted by the token bucket mechanism with N operating levels are placed in a queue, and characterized in that said method furthermore comprises a step for implementing a token bucket mechanism with only one level of operation with only one token buffer, so as to take the packets contained in the queue and send them on the network in carrying out a smoothing of the traffic by limiting the instantaneous bit rate to a value acceptable by the network.

14. A computer program characterized in that it comprises program code instructions

for the execution of the steps of the method according to any of the claims 1 to 3, when said program is executed on a computer.

15. Device for controlling data packet traffic at input of a network, the traffic comprising N streams and/or sub-streams which are each associated with a priority level, $N \geq 2$, each of the packets being marked with the priority level associated with the streams or sub-stream to which said packet belongs,

characterized in that said device comprises means for implementing a token bucket mechanism with N operating levels with N token buffers, each containing a number of available tokens, the tokens of each of the N token buffers being used to process one of the N priority levels, each of the packets being accepted or rejected depending on whether or not it is possible for tokens to be assigned to it depending on the tokens available at least in the token buffer used to process the priority level of said packet.

16. Device according to claim 15, comprising means for sharing tokens of the N token buffers between the N priority levels, a priority i level packet being possibly assigned tokens from a token buffer associated with a priority level j having lower priority when the tokens available in the token buffer having priority level i are not sufficient.

17. Device according to claim 16 characterized in that, for each priority level apart from the highest priority level, said sharing means include means for ensuring a quantity of tokens (K_j) reserved exclusively for the packets possessing said priority level.

18. Network equipment comprising a control device according to any of the claims 15 to 17, characterized in that said network equipment belongs to the group comprising:

- network equipment located between a network of an application or service provider and a network of a network service provider, constituting said network at whose input data packet traffic is controlled;
- routers included in the nodes of a network of a network service provider, constituting said network at whose input a data packet traffic is controlled.